

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



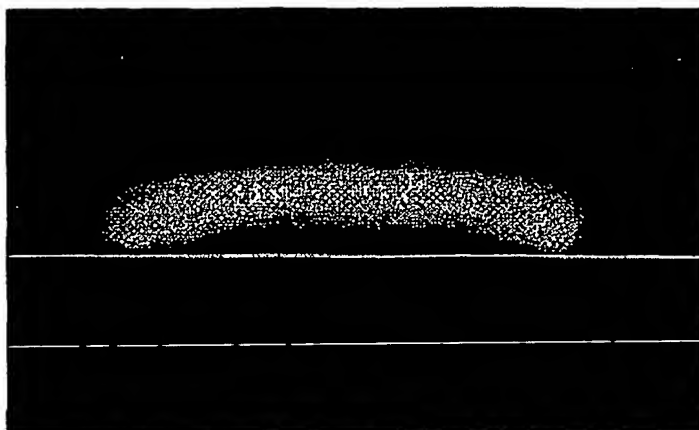
(43) International Publication Date  
26 February 2004 (26.02.2004)

PCT

(10) International Publication Number  
**WO 2004/017359 A3**

- (51) International Patent Classification<sup>7</sup>: **H01J 61/82** Intellectual Property & Standards GmbH, Weisshausstr. 2, 52066 Aachen (DE).
- (21) International Application Number: PCT/IB2003/003425 (74) Agent: **VOLMER, Georg**; Philips Intellectual Property & Standards GmbH, Weisshausstr. 2, 52066 Aachen (DE).
- (22) International Filing Date: 3 August 2003 (03.08.2003) (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (25) Filing Language: English (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- (26) Publication Language: English
- (30) Priority Data: 102 37 598.4 16 August 2002 (16.08.2002) DE
- (71) Applicant (*for DE only*): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-damm 94, 20099 Hamburg (DE).
- (71) Applicant (*for all designated States except DE, US*): **KONINKLIJKE PHILIPS ELECTRONICS N.V.** [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL).
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **MUCKEL, Ralf** [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weisshausstr. 2, 52066 Aachen (DE). **SCHOENE-ICH, Juergen** [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weisshausstr. 2, 52066 Aachen (DE). **HASELHORST, Georg** [DE/DE]; c/o Philips Intellectual Property & Standards GmbH, Weisshausstr. 2, 52066 Aachen (DE). **HAACKE, Michael** [DE/DE]; c/o Philips
- Published:  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 13 May 2004
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: INCREASING THE DISCHARGE ARC DIFFUSENESS IN MERCURY-FREE GAS DISCHARGE LAMPS



Hg-free

(57) Abstract: The invention relates to a mercury-free gas discharge lamp suitable in particular for motor vehicles and having an enhanced discharge arc diffuseness, to its use, and to a method of its manufacture. The mercury-free gas discharge lamp according to the invention has an inner vessel and/or outer bulb with a structured arrangement, which structured arrangement is preferably made such that the discharge arc diffuseness of the mercury-free gas discharge lamp with structured arrangement is increased by dD 0.01 mm to 1.5 mm in comparison with the corresponding gas discharge lamp without structured arrangement.

Best Available Copy

WO 2004/017359 A3

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/03425

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01J61/82

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 952 784 A (WITTING HARALD LUDWIG) 14 September 1999 (1999-09-14) column 2, line 58 - column 3, line 4 column 3, line 36, paragraph 48; figure 1	1,4,6-8, 10
A	-& US 4 810 938 A (DAKIN JAMES T ET AL) 7 March 1989 (1989-03-07) column 2, line 51 - line 63	1
X	EP 1 032 010 A (MATSUSHITA ELECTRIC IND CO LTD) 30 August 2000 (2000-08-30) paragraphs '0097!', '0098!; figure 15	1,10
X	WO 02/17350 A (GEN ELECTRIC) 28 February 2002 (2002-02-28) figure 1	1,6,7,10
Y	page 5, line 14 - line 19 page 5, line 26 - line 28	1-10
	----- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

\*A\* document defining the general state of the art which is not considered to be of particular relevance

\*E\* earlier document but published on or after the International filing date

\*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

\*O\* document referring to an oral disclosure, use, exhibition or other means

\*P\* document published prior to the International filing date but later than the priority date claimed

\*T\* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*Z\* document member of the same patent family

Date of the actual completion of the International search

1 March 2004

Date of mailing of the International search report

05/03/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Zuccatti, S

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/03425

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	DE 198 34 401 A (HELLA KG HUECK & CO) 3 February 2000 (2000-02-03) cited in the application page 1, line 24 - line 63; figures 1-4 -----	1-10
Y	DE 199 10 709 A (AUDI NSU AUTO UNION AG) 14 September 2000 (2000-09-14) column 1, line 55 - column 2, line 1 column 2, line 62 - column 3, line 62 -----	1-10
X	US 5 556 191 A (MAASSEN EGBERTUS J P) 17 September 1996 (1996-09-17)	1,10
Y	column 2, line 30 - line 37 -----	1,2,4, 6-8,10
Y	US 3 384 771 A (POMFRET JOHN M) 21 May 1968 (1968-05-21) column 3, line 13 - line 53; claim 1; figure 1 -----	1,2,4, 6-8,10
Y	US 6 137 230 A (BORN MATTHIAS ET AL) 24 October 2000 (2000-10-24) column 1, line 48, paragraph 54; figure 1 -----	1,10
Y	US 2002/047523 A1 (VAN DOMMELEN MARK JOSEPHUS LUC ET AL) 25 April 2002 (2002-04-25) paragraph '0005!; figure 1 -----	1,10
A	EP 1 111 653 A (MATSUSHITA ELECTRIC IND CO LTD) 27 June 2001 (2001-06-27) paragraph '0165! - paragraph '0169! paragraph '0006! -----	1-10
A	PATENT ABSTRACTS OF JAPAN vol. 0100, no. 35 (E-380), 12 February 1986 (1986-02-12) & JP 60 193255 A (TOSHIBA KK), 1 October 1985 (1985-10-01) abstract -----	1-10

## INTERNATIONAL SEARCH REPORT

PCT/IB 03/03425

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5952784	A	14-09-1999	CN 1248785 A EP 0982759 A1 JP 2000173552 A	29-03-2000 01-03-2000 23-06-2000
US 4810938	A	07-03-1989	BE 1003235 A3 CA 1298344 C DE 3832717 A1 GB 2210498 A , B JP 1132039 A KR 9110109 B1 NL 8801855 A	04-02-1992 31-03-1992 20-04-1989 07-06-1989 24-05-1989 16-12-1991 01-05-1989
EP 1032010	A	30-08-2000	EP 1032010 A1 US 6653801 B1 CN 1277732 T WO 0016360 A1 TW 429390 B CN 1284736 A EP 1037257 A2 JP 2001110356 A TW 446988 B	30-08-2000 25-11-2003 20-12-2000 23-03-2000 11-04-2001 21-02-2001 20-09-2000 20-04-2001 21-07-2001
WO 0217350	A	28-02-2002	US 6536918 B1 AU 8112601 A WO 0217350 A1	25-03-2003 04-03-2002 28-02-2002
DE 19834401	A	03-02-2000	DE 19834401 A1	03-02-2000
DE 19910709	A	14-09-2000	DE 19910709 A1	14-09-2000
US 5556191	A	17-09-1996	CN 1127032 A , B DE 69521371 D1 DE 69521371 T2 EP 0698197 A1 ES 2162634 T3 WO 9524586 A1 JP 8510591 T	17-07-1996 26-07-2001 02-05-2002 28-02-1996 01-01-2002 14-09-1995 05-11-1996
US 3384771	A	21-05-1968	NONE	
US 6137230	A	24-10-2000	CN 1234907 T DE 69817140 D1 EP 0931330 A1 WO 9905699 A1 JP 2001501026 T	10-11-1999 18-09-2003 28-07-1999 04-02-1999 23-01-2001
US 2002047523	A1	25-04-2002	CN 1383576 T WO 0195368 A1 EP 1292966 A1 JP 2003536216 T	04-12-2002 13-12-2001 19-03-2003 02-12-2003
EP 1111653	A	27-06-2001	EP 1111653 A1 JP 2002100322 A US 2001005116 A1	27-06-2001 05-04-2002 28-06-2001
JP 60193255	A	01-10-1985	JP 1771321 C JP 4064140 B	30-06-1993 14-10-1992